# PLANTERS' MEETING.

(Continued on Page 6.)

aided of its virgin trees, takes their place, is too altogether ridiculous to take any notice of. The third and last cause is, of course, the ravages of roaming cattle. It certainly does not take them very long, when confined to a limited area of virgin forest, to beat and trample down the ferns, vines and other underbrush, and in a very short time produce a fine park like landscape, with about fifty or so trees left standing to the acre, which act as a fair shelter for animals, but that is all, for, with the undergrowth of the virgin forest gone, and the closely eaten grass only remaining, we have an ideal waterproof carpet, from which the rain, as it falls, quickly runs off into the ravines, and when the rainstorm is over, so is the supply of water, which under natural conditions would last some time and be given off gradually.

To sum up, the energetic extending cane area sugar planter should be compelled to plant at least five trees for every one he cuts down. The homesteaded should be located on open country where there are no trees, and be compelled to plant a given number, according to the acreage he takes up. The rancher and his cattle should be forever removed from all lands having a semblance of forest left, and confined to the open country, and he also would plant groves of trees for shade for his animals. Finally, everyone who has the good and prosperity of these Islands at heart, should plant trees in ravines and any waste place wherever found. By such means sufficient water would be secured to the householders, and moisten to the agriculturist, who depends entirely on an adequate supply of water to grow his crops and to supply him with comfort and even existence.

At considerable private expense tree planting and in a small way forest preservation has been practiced here in Kohala for many years. The efforts of the pioneers in this good work is apparent today. Not only have their homes been beautified, but ravines and waste places give ample testimony of the good work done and being steadily done.

I regret to say this practice is not as general as it might be, and no great or beneficial results will ever be accomplished until this practice becomes universal and national.

Allow me to again urge the necessity of immediate steps being taken to make forest preservation, re-foresting and tree planting generally a national issue. In order to get the public interested I would suggest the formation of an Arbor Day Society, in every district on these Islands.

The report on the experiment station was presented by Mr. C. F. Eckardt, director of the station. It reads:

Honolulu, H. T., Nov., 1901.

To the President, Officers and Members of the Hawaiian Sugar Planters' Association, Honolulu, H. T.:

Gentlemen:—Your committee on the Experimental Station beg to submit the following report:

During the last part of 1900, a suitable building was erected on the grounds of the Experiment Station and thoroughly equipped under the direction of Mr. R. E. Blouin, for the execution of all kinds of chemical work. As regards size and arrangement, this laboratory has many advantages over the quarters formerly occupied on Nuuanu street, and investigations of a chemical nature have been greatly facilitated.

The nature and amount of work performed during the past year is shown in the following summary:

LABORATORY WORK.

| | |
|---|---|
| Samples analyzed for plantations— | |
| 1.—Soils: | |
| Agricultural Method | 9 |
| Aspartic Acid Method | 50 |
| 2.—Fertilizers | 189 |
| 3.—Sugars | 6 |
| 4.—Cane juices | 6 |
| 5.—Syrups and molasses | 4 |
| 6.—Waters | 12 |
| Total | 276 |
| Samples analyzed for Experiment Station— | |
| 1.—Soils | 24 |
| 2.—Fertilizers | 15 |
| 3.—Cane: | |
| Organic matter, nitrogen and ash | 49 |
| 4.—Juice | 49 |
| 5.—Cane ash: | |
| Partial analyses | 32 |
| Complete analyses | 8 |
| Total | 168 |
| Miscellaneous samples analyzed | 5 |
| Total number of samples analyzed | 449 |

The number of fertilizer samples received by the laboratory for analysis has been more than double number received during the previous year. Allowing a margin of 0.3 of one per cent for each ingredient, a comparison of the analytical results of the laboratory with the guarantees of manufacturers would indicate a shortage equivalent to about $11,000. It was estimated last year that the deficit was in the neighborhood of $12,000, the calculation being based on less than one-half of the number of fertilizers that have been analyzed this year. This would indicate an improvement in the quality of fertilizers that have been put on the market with guarantees.

Field Work.—Tests are being conducted with the ratoons from the varieties of cane planted in June, 1898. Of the thirteen varieties originally planted and which were discussed at some length in the report of the Experiment Station for 1900, three have been omitted from the stubble tests. The Rose Bamboo ratoons were cut for seed and the Fiji Purple and Demerara No. 124 varieties were cut back on account of rust following the rains of last winter.

Plant cane tests were started in August, 1900, with Demerara No. 74, Dem. No. 69, Sacuri, Otaheite, Salangore, and White Bamboo. Of these varieties, Dem. No. 69, Sacuri, Otaheite and Salangore were cut back last December owing to rust, leaving Dem. No. 74 and White Bamboo to be taken off in April or May, 1902, and compared with tests reported at the last meeting of the Association.

The following varieties have been planted during the past year to be taken off in 1903:

Cavengerie, GeeGow, Bangan, Badilla, Sacuri, Otaheite, Salangore, Tibboo Mird, La. Striped, La. Purple, Striped Singapore, Big Ribbon, White Bamboo, Yellow Caledonia, Yellow Bamboo, Demerara Nos. 117, 95, 74, 69, Queensland Nos. 1, 3, 4, 6, 7, 8A, 9.

The varieties which are being grown for seed cane are: Rappol, Dark Bamboo, Daniel Dupont, and Big Tana.

For the new varieties which have been received during the past year, the Experiment Station is indebted to R. E. Blouin, A. Kocbele, E. Hartman and W. C. Stubbs.

The planting tests, started on June 27-29, 1900, by Dr. Maxwell, will not mature until April or May, 1902, when the results will be compared with the old series of tests reported in last year's statement. These experiments were started to observe the results of planting eyes at varying distances from each other, and to note the effect of using different quantities of seed in the row. Lahaina and Rose Bamboo canes will be compared in these tests, the manner of planting being as follows:

Two continuous canes in row.
One continuous cane in row.
One eye per six inches.
One eye per twelve inches.
One eye per eighteen inches.

On July 27th of this year six rows of Lahaina cane were planted by Mr. Blouin to observe the effects of stripping. These experiments will be treated in the following manner:

No stripping.
One stripping in May, 1902.
Two strippings, one in March, the other in October, 1902.
Three strippings, one in March, one in August, and one in November, 1902.

A series of irrigation experiments are in progress, the object being to note the effect of different volumes of water applied at varying intervals. These tests were started in June of this year by Mr. Blouin, and are as follows:

Four rows are receiving 2 inches of water per week.
Three rows, 2 inches per week.
Three rows, 1 inch per week.
Three rows, 2 inches every 3 weeks.
Three rows, 2 inches every two weeks.

These experiments are being conducted with both Lahaina and Rose Bamboo varieties.

Another series of irrigation tests to observe the action of salt on cane are being undertaken in another part of the field. These are divided into four plats, and are irrigated with water containing:

50 grains of salt per U. S. gallon.
100 grains of salt per U. S. gallon.
150 grains of salt per U. S. gallon.
200 grains of salt per U. S. gallon.

A plat of Rose Bamboo and another of Lahaina cane were planted in the latter part of last February, to be taken off in February, 1902, the object of the experiment being to note the yield of sugar in the respective varieties after one year's growth.

Twenty-six plats are devoted to a study of fertilizers, and cover a variety of tests. Through the application of varying quantities of the different fertilizer ingredients, results will be reached to indicate the most suitable forms and economical mixtures. These experiments will also involve a laboratory study as to the amounts of the elements that have been taken up by the cane on the various plats.

During the past year quantities of seed cane representing eleven varieties were distributed among thirty plantations, following a circular letter addressed to plantation managers in regard to results on varieties tests.

Respectfully submitted,
C. F. ECKART,
J. P. COOKE,
W. M. GIFFARD,
AUG. AHRENS.

The report on manufacture is as follows:

To the President, Trustees and Members of the Hawaiian Sugar Planters' Association:

Gentlemen:—Your committee on sugar manufacture submits the following report:

In modern factories nine roller mills provided with Krajewsky crushers or other equally efficient apparatus for preparing the cane, are now being adopted.

It is well known that different varieties of cane vary in milling qualities, some parting with their juices more readily than others, and there is often a great difference in the fiber and sugar contents from fields—especially if the land is rolling—where the same variety of cane is grown.

It is usually considered that with mills as described, a good extraction approximates 93 per cent of the total sugar in the cane. For the purpose of comparing the influence of the fiber and sucrose content of the cane on the extraction, and assuming that the analysis of the bagasse, in all cases, is as follows: Sucrose 5 per cent, fiber 46 per cent, the following table has been prepared:

| Sucrose in cane. | Fiber in cane. 10 per cent. | 11 per cent. | 12 per cent. | 13 per cent. |
|---|---|---|---|---|
| 16 per cent. Extr'n | 93.25 | 92.56 | 91.87 | 91.18 |
| 15 per cent. Extr'n. | 92.89 | 92.06 | 91.33 | 90.60 |
| 14 per cent. Extr'n. | 92.58 | 91.59 | 90.79 | 89.78 |
| 13 per cent. Extr'n. | 91.69 | 90.84 | 90.00 | 89.15 |

The difference of the increased fiber content in the cane will be found in actual practice to have a greater effect in preventing the extraction of the juice than that given in the above table.

*In Louisiana, the difference between 10 per cent and 12 per cent of fiber in the cane reduces its value 6 per cent from an extraction point of view.

*La. Planter, Nov. 24, 1900.

It will be apparent that a mill grinding cane containing 13 per cent sugar and 13 per cent fiber, and obtaining an extraction of 89.15 per cent, will be doing better work than a mill grinding cane of 16 per cent sugar and 10 per cent fiber and obtaining an extraction of 93.25 per cent.

Maceration.—The advantages of maceration in the extraction of sugar from the cane are now recognized in all sugar cane countries, but this system is not yet used to such an extent in these Islands as at the Colonial Sugar Refinery Company's estates in Fiji and Queensland.

In all cases where the juice approximates a purity of 90 per cent a dilution of from 10 to 15 per cent may be used to advantage, and if the sucrose content of the cane is high, a dilution of from 20 to 25 per cent will be found profitable, provided the bagasse furnishes sufficient fuel for the requirements of the factory. If water not exceeding a temperature of 165 F. be used, the greater part of the impurities extracted by the maceration water will be removed in clarifying.

Diffusion.—The diffusion process is not popular as a means of extracting sugar from cane, on account of the cost of fuel, and also because the long exposure of the cane to water of high temperature extracts more than by the milling process, of the pectinous (gums) and nitrogenous substances (amids), which cannot be removed by the ordinary processes of clarification, and consequently interfere with the recovery of the sugar; this is more noticeable in canes having juices of low purity.

Clarification.—The Deming system is now most in favor with planters making sugar for refineries. Mr. Prinsen Geerligs of Java says of superheating: "From a chemical point of view superheat clarification stands in no respects behind the usual defecation process, whilst its mechanical advantages are many."

Evaporation.—The concentration of the clarified and settled or filtered juice should be performed as rapidly as possible, and this is now accomplished in modern factories by means of the Lillie Evaporators.

Filtration.—As much of the impurities are precipitated in concentrating the juice, filtering the syrup, particularly if the juice has been superheated, would be of advantage as it would remove many of these impurities.

Crystallization.—In order to get the best results from impure juices in boiling to grain, the vacuum pan should have ample heating surface, well distributed, so that "the circulation is systematized and defined into unconflicting currents, from the peripheral extremities toward the center, whereby the essential momentum of circulation can be established."

Crystallizers are now in use in several factories in these Islands. A report was presented by Mr. Goodale of the work accomplished by Mr. Jonnson, chemist for the Waialua Agricultural Company.

A report of the investigations of Mr. Princen Geerligs in Java on crystallizer work has already been brought to your attention by Mr. Geo. Ross in the September number of the Planter's Monthly.

Drying Sugars.—Water driven centrifugals are growing in favor, and have many advantages over the belt driven machines. Granulators are used only in a few factories.

Preservation of Sugar in Storage or Transit.—Cleanliness in all departments, careful clarification of the juice and watchfulness to prevent incipient fermentation in the sugar house, this and careful drying of the sugar before packing, will usually be found sufficient to prevent deterioration. It has been suggested to disinfect the packing material and to protect the sugar as much as possible from moisture by suitable covering, when stored or in transit. It has been found that the alkalinity of sugar does not affect its keeping qualities.

Utilization of Waste Products.—The value of press cake as a fertilizer has already been brought to your attention in the report on Manufacture of 1899.

Bagasse as Fuel.—Excellent results have been obtained by burning the bagasse in furnaces of the Dutch oven type, having step ladder grate bars. The value of bagasse as it comes from the mills as compared with good coal is as follows:

3.34 tons of bagasse, containing 42.70 per cent moisture equals one ton of coal.
4.17 tons of bagasse, containing 31 per cent of moisture, equals one ton of coal.

**Mr. Hubert Edson of Louisiana proposes to use the heat of the chimney gases to dry the bagasse before using, and in this way effect a saving of 15 per cent in its fuel value.

The process of making paper from bagasse at a large mill in Texas is described in the Louisiana Planter of October 5: "Eight million pounds of paper were made from 40,000,000 pounds of bagasse. The paper sells at 2 cents per pound, making the value of this product $160,000. The cost of manufacture is not given, but that it pays is shown by the fact that mills in Louisiana will shortly add this branch of manufacture to their establishments."

The day may not be far distant when sugar will be shipped in containers made from bagasse, and having greater strength than those now used, and with air and water proof qualities.

Molasses as Food for Live Sock.—The value of sugar as food has been well demonstrated by numerous experiments made in Europe and America. The value of molasses as a food for live stock should not be overlooked. **In Germany molasses is prepared as food for cattle by heating it up to 90 degrees and then introducing it in a steady stream into a mechanical mixer, at the same time the forage with which the molasses is to be incorporated is also fed into the machine. There issues from the mixer a coarse grained mass which in several hours becomes a dry product easily broken up and preserved. Materials used are wheat straw, corn, etc.

**La. Planter, April 14, 1900.

A food for stock has been made by grinding cornstalks to powder, mixing this with molasses, and then pressing it into cakes by means of a hydraulic press. It can then be shipped as easily as baled hay. For feeding it is taken up and mixed with water.

Extensive experiments in feeding molasses to horses have been made by the Colonial Sugar Refining Company, and the ration recommended for animals weighing 1,200 pounds is fifteen pounds of molasses, three pounds bran and four pounds maize per day, with all the cane tops they will eat.

This system of feeding is endorsed by Dr. Dalrymple, the most prominent veterinarian in Louisiana.

Manufacture of Alcohol from Molasses.—The process of working cane sugar molasses is essentially the same as for beet sugar molasses. The molasses is diluted with water and acidulated with sulphuric acid until it will slightly redden litmus paper. The process in a large distillery in France is as follows: 8,140 lbs. of molasses are taken for each fermenting vat of 41,884 gallons capacity, which gives to the mash a concentration of about 14 per cent. To this is added sufficient molasses lees, which increases the concentration about 5 per cent. The mass is brought to fermentation with beer yeast at a temperature of 68 degrees to 77 degrees F. Fermentation is extremely violent, and produces in the extraordinarily large quantity of mash fermenting in one vat such an increase in temperature as to necessitate the cooling of the fermenting mass by cold water circulating in large serpentine pipes placed in the center of the vat. The temperature must never rise above 93.2 F. Should the commencement of fermentation be delayed the temperature can be raised by the circulation of warm water through the serpentine pipes.

Fermentation is generally considered complete in 48 hours, and the yield is given as 13.6 gallons of 97 per cent alcohol from 100 kilograms (220 lbs.) of molasses.

The manufacture of molasses into alcohol could be accomplished in the sugar house without additional machinery. Syrup and molasses tanks could be used for fermenting vats and an ordinary standard double effect can easily be converted into a still by keeping the tubes or drum of the second effect surrounded by cold water and drawing off the vapor from the mash in the first pan, as condensed, through the exhaust pipe of the second effect. Two parts of kiln dried malt and one part of compressed yeast (beer yeast of good quality) to 100 of molasses should be used to start fermentation.

Very respectfully,
E. E. OLDING,
Chairman.
C. C. KENNEDY,
Member.
AUG. AHRENS,
Member.
W. GOODALE,
Member.
GEO. FAIRCHILD,
Member.

The report of the committee on machinery presented by C. Hedemann, was to the effect that data had been gathered which were submitted as individual contributions to the report, as follows:

No. 1.—Description of Machinery, and results of experiments with bagasse-burning furnace at Honolulu Sugar Company, by Mr. Jas. A. Low.

No. 2.—Paper by Mr. W. W. Goodale on Waialua Mill.

No. 3.—Description of the McBryde Sugar Company's new sugar house, by Mr. W. Stodart.

No. 4.—Description of "Puunene" Mill, Hawaiian Commercial and Sugar Company, by Mr. C. Hedemann.

No. 5.—Description of Olaa Sugar Company's Mill, by Mr. C. Hedemann.

No. 6.—Description of the reconstructed Ewa Mill, by Mr. C. Hedemann.

No. 7.—Description of Puako Mill, by Mr. C. Hedemann.

No. 8.—Paper on Mill Extraction, by Mr. C. Hedemann.

No. 9.—Paper on Sand Filters, by Mr. C. Hedemann.

No. 10.—Paper on Centrifugal Work, by Mr. C. Hedemann.

No. 11.—Paper on Sugar Drying Machinery, by Mr. John Hind.

No. 12.—Paper on "Lillie" Evaporator, and Vick's Cane Unloader, by Mr. John Watt.

No. 13.—Paper on Crystallization in Motion, Machinery Used and Modus Operandi, by Mr. P. A. G. Messchaert.

## THE RIGHT SORT OF DINNER.

It is nice to hear Mr. F. Fern say he enjoys his meals. A dinner that tastes good, that goes to the spot like a horse on his way home, a dinner that is eaten in pleasant surroundings, and with plenty of easy talk and laughter—that is the sort of dinner for me.

It is worth a dozen made of poor stuff badly cooked, and swallowed under conditions that would spoil the appetite of a shark.

That you may get all the benefit that can possibly be got from a dinner, I say, the food itself must be all right, the circumstances all right, and your (and here is where the main point comes in) your digestion all right.

A rare and difficult combination, oh my half-starved fellow pilgrims through this vale of bad cooks, solemn fools, weak stomachs, and sordid boarding-house keepers.

In early life Mr. Fern, who now lives at 93, Victoria street, Auckland, N. Z., followed the sea. Although he does not allude to it we may assume that he was not troubled with indigestion at that time. Seafaring men are apt to have keen appetites—appetites worthy of better grub than most of them get hold of.

It was after Mr. Fern knocked off the sea and tried his luck on land that his digestive apparatus failed to respond to his demands upon it.

Writing on the 6th April, 1900, he says: "My complaint first made itself felt about eighteen years ago. I was constipated, had almost constant eructations, and frequent spells of palpitation.

"In spite of all I could do, or get the doctors to do, to cure it, this ailment (whatever the real cause or root of it may have been) went on for eight years. And a right nasty strip of time that was; it is logged in my memory as a long spell of heavy weather.

"I fairly dreaded my meals; the act of eating sickened and disgusted me, even when the food was what it ought to be.

"Well, matters went on this way one year after another until I got, in a manner of speaking, sunk down into the situation and become used to it as a man does to being locked up in prison.

"Finally I ran across Mother Seigel's Syrup and tried it, because a man I knew said he believed in it.

"It helped me from the first go off, and in about seven months I was a well man from top to toe. The constipation, the dyspepsia, and the heart trouble were all gone. My eye is now clear, my hand is steady, and my appetite and digestion would pass inspection anywhere.

"I have traded for fifteen years at my present address, and am well known in this city.

"I mention the time that Mother Seigel's Syrup took to cure me (seven months) so that people with chronic ailments, and deep-seated ones too, may not be discouraged and leave off the medicine.

"My advice is, persevere, stick to it, never give up, and the Syrup is certain to pull you through.

"I enjoy my meals nowadays, and it has got to be a pretty bad dinner that makes me leave the table unsatisfied."

### Rough on the Rats.

The Oahu Railway and Land Company started on an active campaign on rats yesterday, and preparations were begun which will make the company's property a very disagreeable place for any poor rodent to inhabit. It is intended to make the big wharf where the Hawaiian-American Steamship Company's shed is situated, practically air tight, by caulking the entire flooring. This can easily be done, as the flooring is of recent construction, and in good repair. On the sides of the wharf, walls will be built which will extend way down into the water. These will also be made air tight. An arrangement will be made by which sulphur can be pumped underneath the wharf, and the practically air-tight construction of the wharf will hold the deadly fumes sufficiently to kill every rat inside.

On the smaller wharf no attempt will be made to make it air tight, but the wharf will be cut clear from the shore in order to prevent rats from getting over on it. This will be done by cutting off about ten feet of the wharf close to the shore, just leaving timbers for the supporting of the railroad tracks. The rats will be prevented from crossing the timbers by means of metal guards which will be placed around the timbers.

The whole work is being carried out according to plans suggested by Dr. Cofer, and the whole arrangement will probably be finished in a few weeks. The wharves on the city side of the harbor will be placed in the same condition as soon as the funds permit.

## JUMPED ON A TENPENNY NAIL.

The little daughter of Mr. J. N. Powell jumped on an inverted rake made of tenpenny nails, and thrust one nail entirely through her foot, and a second one half way through. Chamberlain's Pain Balm was promptly applied, and five minutes later the pain had disappeared, and no more suffering was experienced. In three days the child was wearing her shoe as usual, and with absolutely no discomfort. Mr. Powell is a well known merchant of Forkland, Va., U. S. A. Pain Balm is an antiseptic and heals such injuries without maturation and in one-third the time required by the usual treatment. For sale by all druggists and dealers. Benson, Smith & Co., Ltd., agents for Hawaii Territory.

LONDON, Nov. 8.—Great Britain, Egypt and Abyssinia have settled the main outlines of the delimitation of the Soudan frontier. A mixed Anglo-Turkish Commission delimitates the hinterland at Aden.